

**FINAL  
FIELD SAMPLING PLAN FOR  
CONTROL AREAS 9, 10, 11, and 14**

**OF THE  
CAMP EDWARDS IMPACT AREA  
GROUNDWATER QUALITY STUDY**

**MASSACHUSETTS MILITARY RESERVATION  
CAPE COD, MASSACHUSETTS**

**Prepared for**

**NATIONAL GUARD BUREAU  
ARLINGTON, VIRGINIA**

**Prepared by**

**OGDEN ENVIRONMENTAL AND ENERGY SERVICES  
239 Littleton Road, Suite 1B  
Westford, Massachusetts 01886**



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# Final FSP Control Areas

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## DISCLAIMER:

This document has been prepared pursuant to a government administrative order (U.S. EPA Region I SDWA Docket No. I-97-1019) and is subject to approval by the U.S. Environmental Protection Agency. The opinions, findings, and conclusions expressed are those of the authors and not necessarily those of the Environmental Protection Agency.



## A.9 Control Areas Field Sampling Plan

### A.9.1 Background and Focal Area(s)

Control Areas have been randomly identified at locations that are not expected to be within the immediate target areas of concern. Based on historical aerial photographs and information collected during the Range Use History Report research these areas do not appear to have been impacted by range use. There are four Control Areas (9, 10, 11, and 14) within the MMR Impact Area as illustrated in Figure A.9-1. Sampling in these areas will provide compound concentrations for comparison with areas directly impacted by range use.

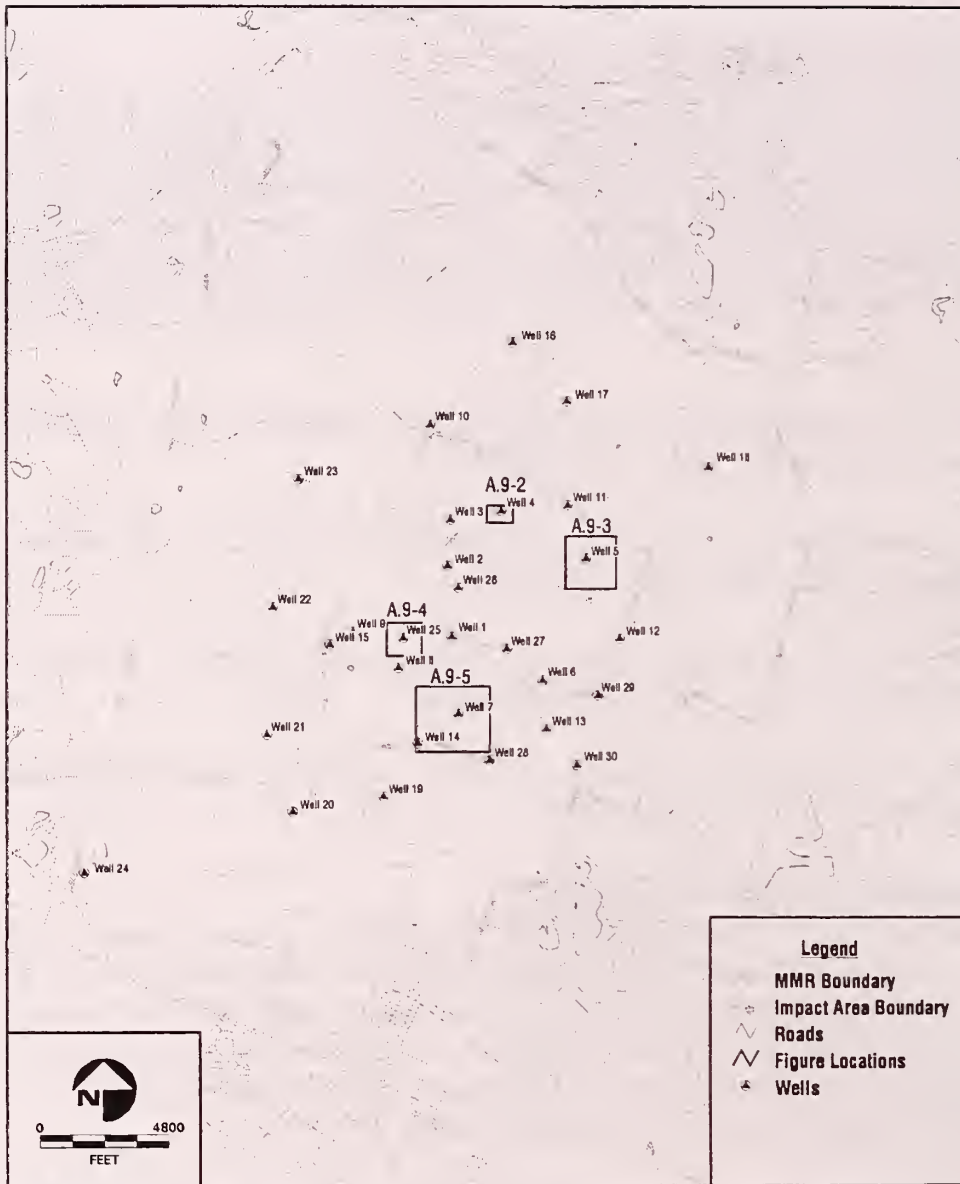
- **Area 9** - As indicated in Figure A.9-2, five surface sample grids will be placed in the area surrounding shallow monitoring well, MW-4.
- **Area 10** - As indicated in Figure A.9-3, five surface sample grids will be placed in the area surrounding monitoring well nest, MW-5.
- **Area 11** - As indicated in Figure A.9-4, five surface sample grids will be placed in the area surrounding shallow monitoring well, MW-25.
- **Area 14** - As indicated in Figure A.9-5, five surface sample grids will be placed along the access to monitoring well nest, MW-7.

### A.9.2 Sampling & Analysis Methods

Control Area sampling will include surface soil, subsurface soil, and groundwater. All surface soil samples will be collected at locations which are undisturbed by excavation or road building activities. Sample collection will be consistent with MMR SOPs, the Ogden Health and Safety Guidelines, Attachment A: Field Guide to High Explosives, and the EPA Standard Guide for Composite Sampling and Field Subsampling for Environmental Waste Management Activities (October 31, 1996).

Control Areas 9, 10, 11, and 14 are within the Impact Area, therefore all soil samples with detectable levels of explosives by the colorimetric analysis will be analyzed by EPA Method 8330. **All borings and hand auger locations in the control area are subject to UXO clearance requirements.**

# Final FSP Control Areas



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MMR - Area Samples Vicinity Map

FIGURE

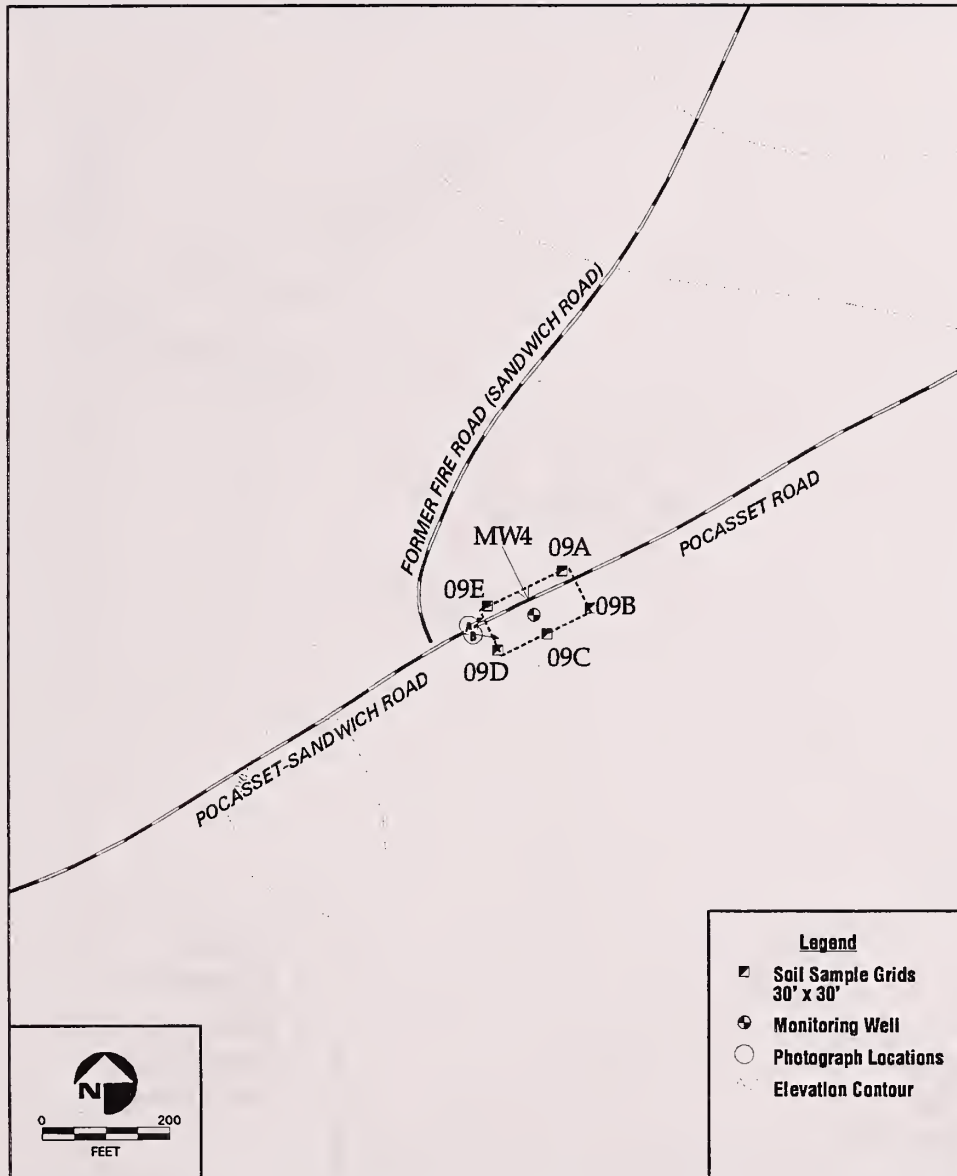
**A.9-1**

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# Final FSP Control Areas



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Area 9 Sampling Points

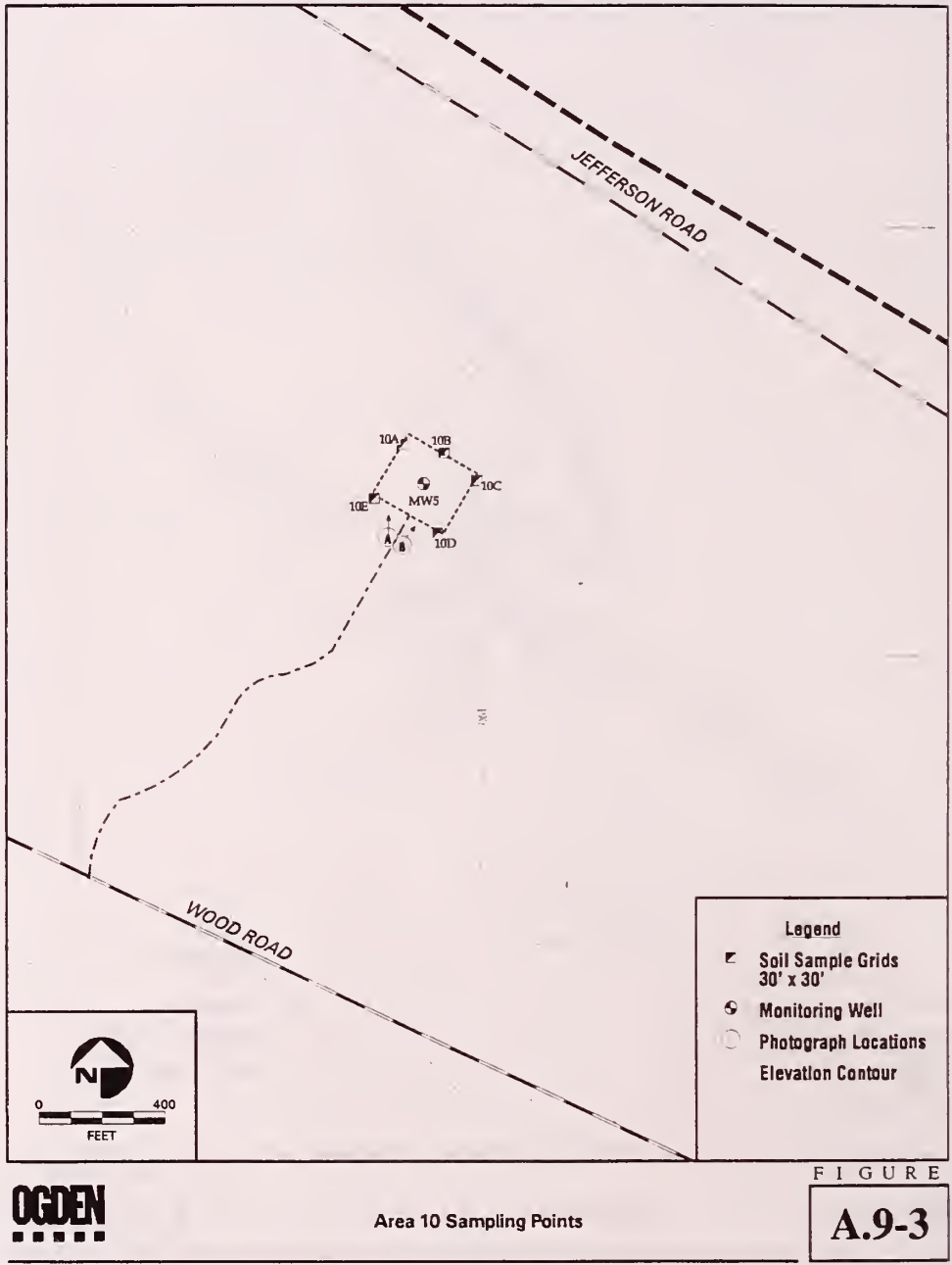
FIGURE

**A.9-2**

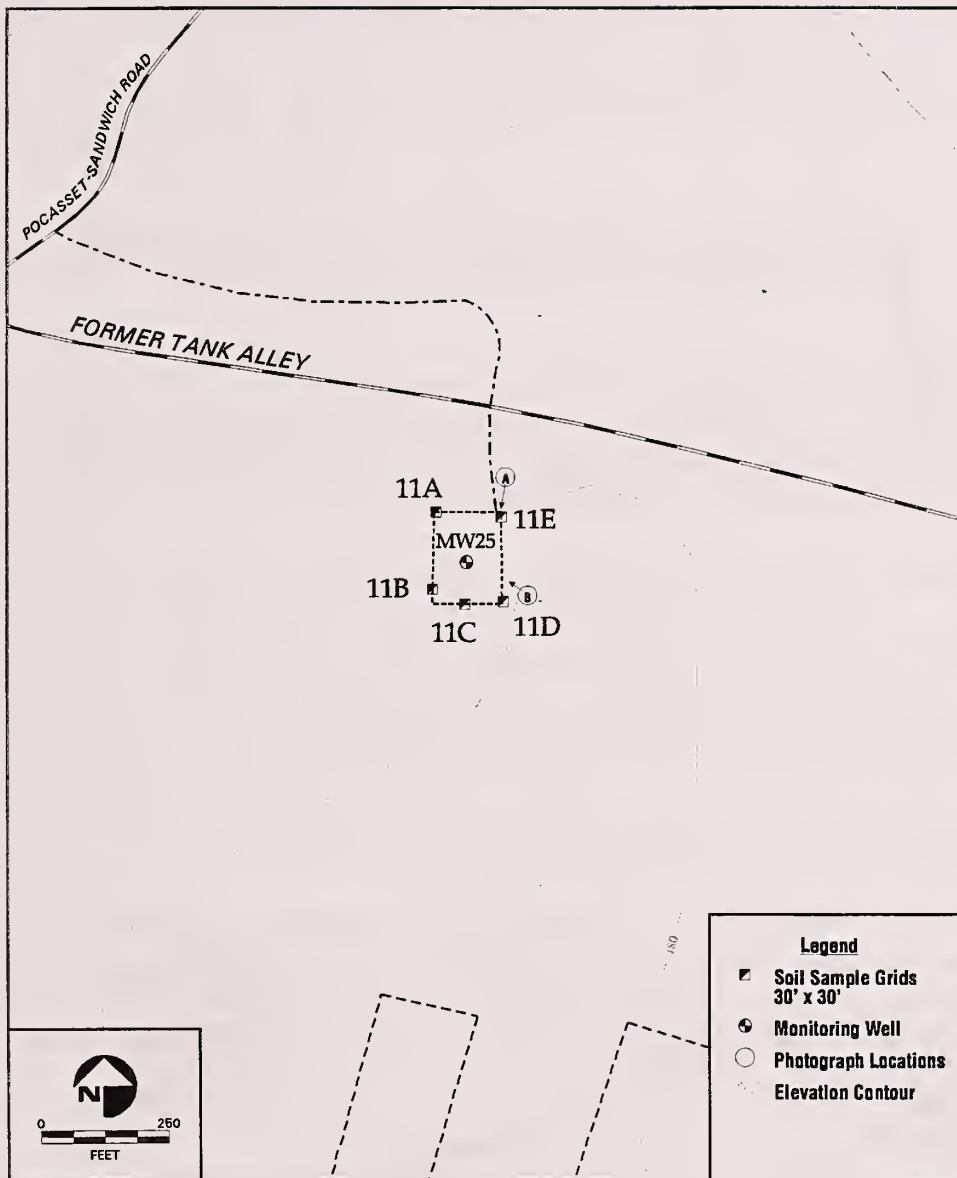
/usr/local/plan/figures/area9/samples.sxd

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# Final FSP Control Areas



# Final FSP Control Areas



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Area 11 Sampling Points

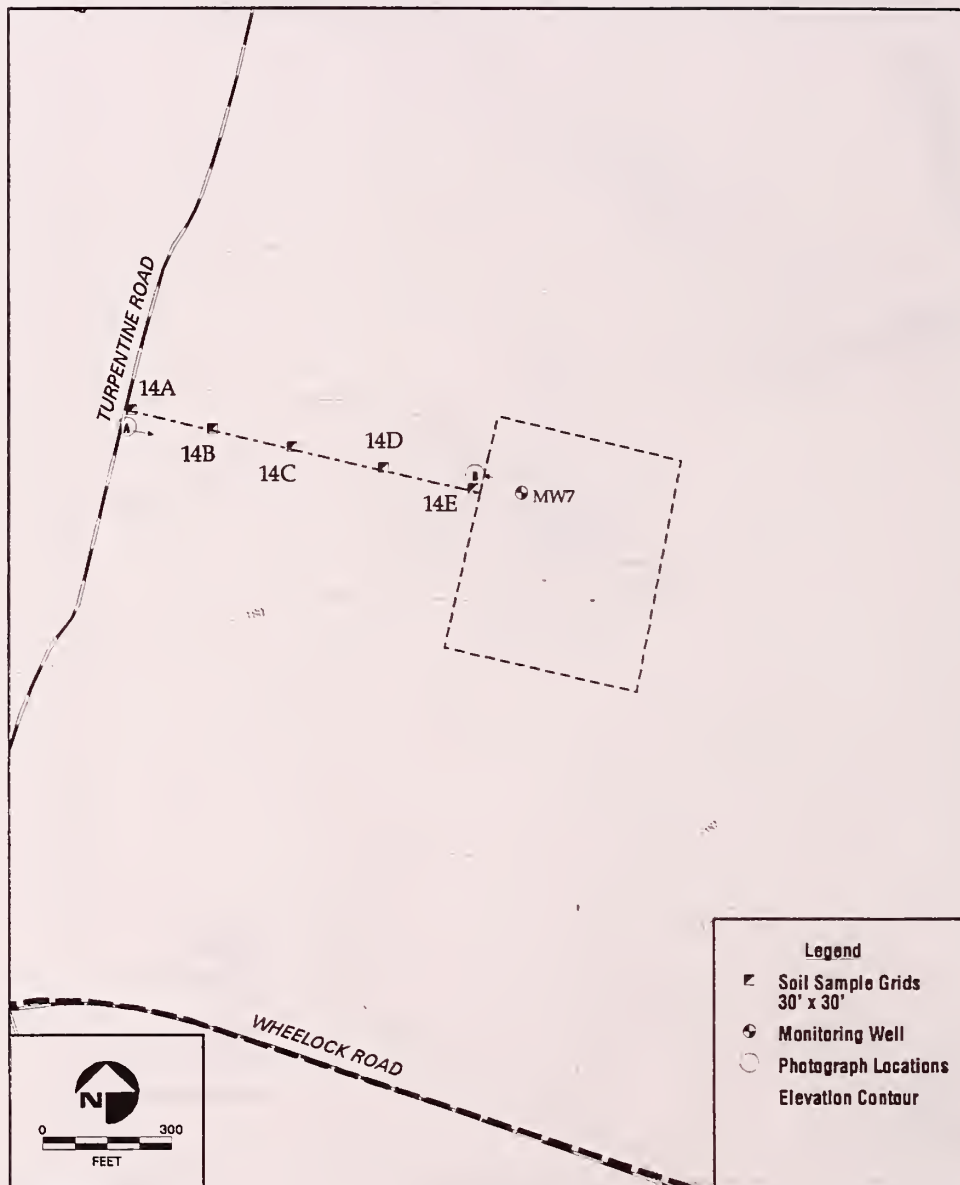
FIGURE

**A.9-4**

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# Final FSP Control Areas



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Area 14 Sampling Points

FIGURE

**A.9-5**

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# Final FSP Control Areas

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## **Hand Auger Grids**

A representative portion of each control area will be sampled, as indicated in Figures A.9-2, A.9-3, A.9-4, and A.9-5. For Areas 9, 10, and 11, five surface sample grids will be placed in the immediate vicinity of the cleared area for monitoring wells MW-4, MW-25, and MW-5, respectively. For Area 14, surface sample grids will be placed along the access to monitoring well MW-7.

Each soil boring grid will consist of nine sample points spaced ten feet apart as illustrated in Figure A.9-6. The following protocol will be followed for hand augering:

1. A 0-6" soil sample will be collected from each of the nine sample points in a grid;
2. soil from each sample point will be placed in a headspace jar;
3. the remaining soil from each of the nine sample points will be composited in accordance with Section 8.1 of the EPA Standard Guide and Attachment A of this FSP;
4. headspace measurements will be collected from each of the nine 0-6" samples and recorded in the space provided on the hand auger log;
5. a VOC grab sample will be collected from one sample point based on the following priority of observations: 1) highest response on the FID, 2) visual signs of contamination, 3) the central grid location (a fresh soil sample will be collected adjacent to the sample point). The VOC sample will be collected from within one-foot of the full screening sample;
6. the 0-6" composite sample will be submitted for explosives, inorganics, and other analytes;
7. when the analytical results from the 0-6" sample are available, an 18-24" sample will be collected and composited as described above for explosives and inorganics. Any other analytes (except VOC) that are detected in the 0-6" sample will be analyzed;
8. an 18-24" sample will be selected for VOC analysis based on screening with an FID as described in steps 1-5 above.

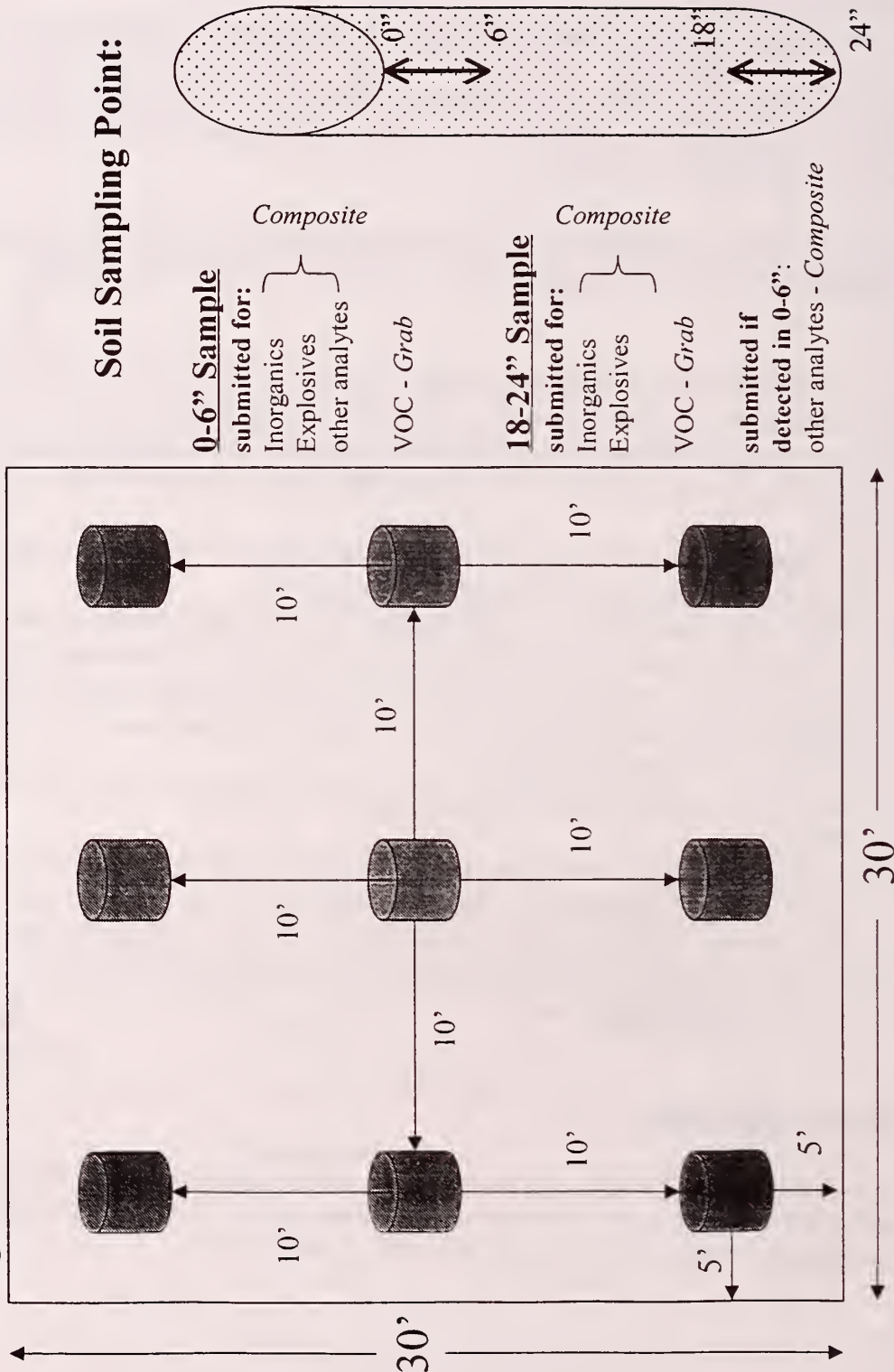
## **Barber Rig Drilling**

For Control Areas 9 and 11, a shallow boring will be advanced within the Target Area indicated in Figure A.9-1 and Figure A.9-3, respectively. These borings will be completed as shallow monitoring wells, MW-4 and MW-25.

# Final FSP Control Areas



**Figure A.9-6: Plan of Soil Sampling Grid:**





# Final FSP Control Areas

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For Control Areas 10 and 14, a boring will be advanced to bedrock within the Target Area indicated in Figure A.9-2 and Figure A.9-4, respectively. These will be completed as a nested shallow and deep monitoring wells, MW-5 and MW-7. At each location, an intermediate depth well will be completed in an adjacent boring at a depth based on the VOC and explosives screening of groundwater for the initial boring.

Prior to the onset of the investigation, the site will be intrusively cleared of UXO to a depth of two feet below grade. Additional clearance will occur from a depth of two feet to 10 feet below grade. A down-hole magnetometer will be lowered into the hole prior to advancing the auger in two-foot intervals. After completion of the next two-foot interval, 4" PVC will be inserted into the borehole and the rig will be moved off of the hole prior to magnetic survey of the next interval. The boring location will be considered clear when a depth of ten feet is reached without encountering any magnetic anomalies (clearance to 12 feet).

The following protocol will be followed while drilling with a barber rig in the Impact Area:

1. A 0-6" sample will be collected and submitted for explosives, inorganics, and all other analytes;
2. From ten feet below grade until the water table is encountered, a soil sample will be collected every ten feet using a split spoon;
3. The 10-12' interval will be FID screened and submitted for explosives, inorganics, and other analytes;
4. The 20-22' interval will be FID screened and submitted for explosives, and inorganics;
5. Each sample below the 20-22' interval will be screened with an FID and sampled for explosives (submitted ON HOLD) and inorganic analysis;
6. The soil samples submitted ON HOLD for explosives will be analyzed only if explosives are detected in the 10-12' or 20-22' sample interval; and
7. Each sample at and below the 20-22' interval will be sampled for the other analytes only if there is a response on the FID.
8. An 18-24" sample will be collected for explosives and inorganics analysis after results from the 0-6" sample are received'
9. An 18-24" sample will be collected and submitted for any other analytes detected in the 0-6" sample when the results are received;
10. The boring will be advanced 15 feet from refusal to confirm that bedrock has been encountered.

# Final FSP Control Areas

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11. From the water table to the completion of the boring, soil will be sampled from the cyclone for lithology. Groundwater samples will be collected at every ten feet during advancement of the borings and will be submitted for laboratory analysis of explosives and VOCs. Wells will be screened as described in Section 4.2.2 of the Action Plan.

Table A.9-1 lists sample numbers and analytical requirements for the areas to be investigated.



# Final FSP Control Areas

Table A.9-1: MMR Soil Samples from Hand Auger Grids						Parameters:	Explosives (colorimetric)	Explosives (EPA 8330)	Inorganics	Target Analytes:	VOC	SVOC	PCB/Pest.	Herbicide	EDB	MTBE
Area	Grid	Depth	Type	MMR ID	EPA/Ogden ID	Cont:	8oz	8oz	8oz		4 oz.	8 oz.			4 oz.*	
9	09A	0-6	grab	71BS09AXAX01XA	B09AAA						X					
			comp	71BS09AXAX01XA	B09AAA		X		X			X	X	X	X	X
		18-24	grab	71BS09AXBX01XA	B09ABA						#					
			comp	71BS09AXBX01XA	B09ABA		O		O			#	#	#	#	#
	09B	0-6	grab	71BS09BXAX01XA	B09BAA						X					
			comp	71BS09BXAX01XA	B09BAA		X		X			X	X	X	X	X
		18-24	grab	71BS09BXXB01XA	B09BBA						#					
			comp	71BS09BXXB01XA	B09BBA		O		O			#	#	#	#	#
	09C	0-6	grab	71BS09CXAX01XA	B09CAA						X					
			comp	71BS09CXAX01XA	B09CAA		X		X			X	X	X	X	X
		18-24	grab	71BS09CXXB01XA	B09CBA						#					
			comp	71BS09CXXB01XA	B09CBA		O		O			#	#	#	#	#
	09D	0-6	grab	71BS09DXAX01XA	B09DAA						X					
			comp	71BS09DXAX01XA	B09DAA		X		X			X	X	X	X	X
		18-24	grab	71BS09DXXB01XA	B09DBA						#					
			comp	71BS09DXXB01XA	B09DBA		O		O			#	#	#	#	#
	09E	0-6	grab	71BS09EXAX01XA	B09EAA						X					
			comp	71BS09EXAX01XA	B09EAA		X		X			X	X	X	X	X
		18-24	grab	71BS09EXBX01XA	B09EBA						#					
			comp	71BS09EXBX01XA	B09EBA		O		O			#	#	#	#	#
10	10A	0-6	grab	71BS10AXAX01XA	B10AAA						X					
			comp	71BS10AXAX01XA	B10AAA		X		X			X	X	X	X	X
		18-24	grab	71BS10AXBX01XA	B10ABA						#					
			comp	71BS10AXBX01XA	B10ABA		O		O			#	#	#	#	#
	10B	0-6	grab	71BS10BXAX01XA	B10BAA						X					
			comp	71BS10BXAX01XA	B10BAA		X		X			X	X	X	X	X
		18-24	grab	71BS10BXXB01XA	B10BBA						#					
			comp	71BS10BXXB01XA	B10BBA		O		O			#	#	#	#	#
	10C	0-6	grab	71BS10CXAX01XA	B10CAA						X					
			comp	71BS10CXAX01XA	B10CAA		X		X			X	X	X	X	X
		18-24	grab	71BS10CXXB01XA	B10CBA						#					
			comp	71BS10CXXB01XA	B10CBA		O		O			#	#	#	#	#
X = to be collected and submitted to laboratory																
O = to be collected after results from the 0-6" sample are collected																
# = to be collected if detected in the 0-6" sample																

# Final FSP Control Areas

Table A.9-1: MMR Soil Samples from Hand Auger Grids						Parameters:	Explosives (colorimetric)	Explosives (EPA 8330)	Inorganics	Target Analytes:	VOC	SVOC	PCB/Pest.	Herbicide	EDB	MTBE	
Area	Grid	Depth	Type	MMR ID	EPA/Ogden ID	Cont:	8oz	8oz	8oz		4 oz.	8 oz.			4 oz.*		
10 Cont.	10D	0-6	grab	71BS10DXAX01XA	B10DAA						X						
			comp	71BS10DXAX01XA	B10DAA		X		X			X	X	X	X	X	
		18-24	grab	71BS10DXBX01XA	B10DBA						#						
			comp	71BS10DXBX01XA	B10DBA		O		O			#	#	#	#	#	
	10E	0-6	grab	71BS10EXAX01XA	B10EAA						X						
			comp	71BS10EXAX01XA	B10EAA		X		X			X	X	X	X	X	
		18-24	grab	71BS10EXBX01XA	B10EBA						#						
			comp	71BS10EXBX01XA	B10EBA		O		O			#	#	#	#	#	
	11	11A	0-6	grab	71BS11AXAX01XA	B11AAA						X					
				comp	71BS11AXAX01XA	B11AAA		X		X			X	X	X	X	X
18-24			grab	71BS11AXBX01XA	B11ABA						#						
			comp	71BS11AXBX01XA	B11ABA		O		O			#	#	#	#	#	
11B		0-6	grab	71BS11BXAX01XA	B11BAA						X						
			comp	71BS11BXAX01XA	B11BAA		X		X			X	X	X	X	X	
		18-24	grab	71BS11BXXB01XA	B11BBA						#						
			comp	71BS11BXXB01XA	B11BBA		O		O			#	#	#	#	#	
11C		0-6	grab	71BS11CXAX01XA	B11CAA						X						
			comp	71BS11CXAX01XA	B11CAA		X		X			X	X	X	X	X	
		18-24	grab	71BS11CXXB01XA	B11CBA						#						
			comp	71BS11CXXB01XA	B11CBA		O		O			#	#	#	#	#	
11D		0-6	grab	71BS11DXAX01XA	B11DAA						X						
			comp	71BS11DXAX01XA	B11DAA		X		X			X	X	X	X	X	
		18-24	grab	71BS11DXBX01XA	B11DBA						#						
			comp	71BS11DXBX01XA	B11DBA		O		O			#	#	#	#	#	
11E		0-6	grab	71BS11EXAX01XA	B11EAA						X						
			comp	71BS11EXAX01XA	B11EAA		X		X			X	X	X	X	X	
		18-24	grab	71BS11EXBX01XA	B11EBA						#						
			comp	71BS11EXBX01XA	B11EBA		O		O			#	#	#	#	#	
14	14A	0-6	grab	71BS14AXAX01XA	B14AAA						X						
			comp	71BS14AXAX01XA	B14AAA		X		X			X	X	X	X	X	
		18-24	grab	71BS14AXBX01XA	B14ABA						#						
			comp	71BS14AXBX01XA	B14ABA		O		O			#	#	#	#	#	
	14B	0-6	grab	71BS14BXAX01XA	B14BAA						X						
			comp	71BS14BXAX01XA	B14BAA		X		X			X	X	X	X	X	
		18-24	grab	71BS14BXXB01XA	B14BBA						#						
			comp	71BS14BXXB01XA	B14BBA		O		O			#	#	#	#	#	
X = to be collected and submitted to laboratory																	
O = to be collected after results from the 0-6" sample are collected																	
# = to be collected if detected in the 0-6" sample																	

# Final FSP Control Areas

Table A.9-1: MMR Soil Samples from Hand Auger Grids						Parameters:	Explosives (colorimetric)	Explosives (EPA 8330)	Inorganics	Target Analytes:	VOC	SVOC	PCB/Pest.	Herbicide	EDB	MTBE
Area	Grid	Depth	Type	MMR ID	EPA/Ogden ID	Cont:	8oz	8oz	8oz		4 oz.	8 oz.			4 oz.*	
	14C	0-6	grab	71BS14CXAX01XA	B14CAA						X					
			comp	71BS14CXAX01XA	B14CAA		X		X			X	X	X	X	X
		18-24	grab	71BS14CXBX01XA	B14CBA						#					
			comp	71BS14CXBX01XA	B14CBA		O		O			#	#	#	#	#
	14D	0-6	grab	71BS14DXAX01XA	B14DAA						X					
			comp	71BS14DXAX01XA	B14DAA		X		X			X	X	X	X	X
		18-24	grab	71BS14DXBX01XA	B14DBA						#					
			comp	71BS14DXBX01XA	B14DBA		O		O			#	#	#	#	#
	14E	0-6	grab	71BS14EXAX01XA	B14EAA						X					
			comp	71BS14EXAX01XA	B14EAA		X		X			X	X	X	X	X
		18-24	grab	71BS14EXBX01XA	B14EBA						#					
			comp	71BS14EXBX01XA	B14EBA		O		O			#	#	#	#	#
X = to be collected and submitted to laboratory																
O = to be collected after results from the 0-6" sample are collected																
# = to be collected if detected in the 0-6" sample																



# Final FSP Control Areas

Table A.9-1: MMR Subsurface Soil Samples for Laboratory Analysis from Borings					Parameters:	Explosives (colorimetric)	Explosives (EPA 8330)	Inorganics	Target Analytes:	VOC	SVOC	PCB/Pest.	Herbicide	EDB	MTBE	
Area	Loc.	Depth	MMR ID	EPA/Ogden ID	Cont.	8oz	8oz	8oz		4oz	8 oz.			4oz		
9	MW4	A(0-6")	71MS04DXAX01XA	S04DAA		X		X		X	X	X	X	X	X	
		B(18-24")	71MS04DXBX01XA	S04DBA		@		@		@	@	@	@	@	@	
		C(10-12')	71MS04DXCX01XA	S04DCA		X		X		X	X	X	X	X	X	
		D(20-22')	71MS04DXDX01XA	S04DDA		X		X		*	*	*	*	*	*	
		E	71MS04DXEX01XA	S04DEA		X		X		*	*	*	*	*	*	
		F	71MS04DXFX01XA	S04DFA		X		X		*	*	*	*	*	*	
		G	71MS04DXGX01XA	S04DGA		X		X		*	*	*	*	*	*	
		H	71MS04DXHX01XA	S04DHA		X		X		*	*	*	*	*	*	
		I	71MS04DXIX01XA	S04DIA		X		X		*	*	*	*	*	*	
		J	71MS04DXJX01XA	S04DJA		X		X		*	*	*	*	*	*	
		K	71MS04DXKX01XA	S04DKA		X		X		*	*	*	*	*	*	
		L	71MS04DXLX01XA	S04DLA		X		X		*	*	*	*	*	*	
M	71MS04DXMX01XA	S04DMA		X		X		*	*	*	*	*	*			
10	MW5	A(0-6")	71MS05DXAX01XA	S05DAA		X		X		X	X	X	X	X	X	
		B(18-24")	71MS05DXBX01XA	S05DBA		@		@		@	@	@	@	@	@	
		C(10-12')	71MS05DXCX01XA	S05DCA		X		X		X	X	X	X	X	X	
		D(20-22')	71MS05DXDX01XA	S05DDA		X		X		*	*	*	*	*	*	
		E	71MS05DXEX01XA	S05DEA		X		X		*	*	*	*	*	*	
		F	71MS05DXFX01XA	S05DFA		X		X		*	*	*	*	*	*	
		G	71MS05DXGX01XA	S05DGA		X		X		*	*	*	*	*	*	
		H	71MS05DXHX01XA	S05DHA		X		X		*	*	*	*	*	*	
		I	71MS05DXIX01XA	S05DIA		X		X		*	*	*	*	*	*	
		J	71MS05DXJX01XA	S05DJA		X		X		*	*	*	*	*	*	
		K	71MS05DXKX01XA	S05DKA		X		X		*	*	*	*	*	*	
		L	71MS05DXLX01XA	S05DLA		X		X		*	*	*	*	*	*	
M	71MS05DXMX01XA	S05DMA		X		X		*	*	*	*	*	*			
11	MW25	A(0-6")	71MS25DXAX01XA	S25DAA		X		X		X	X	X	X	X	X	
		B(18-24")	71MS25DXBX01XA	S25DBA		@		@		@	@	@	@	@	@	
		C(10-12')	71MS25DXCX01XA	S25DCA		X		X		X	X	X	X	X	X	
		D(20-22')	71MS25DXDX01XA	S25DDA		X		X		*	*	*	*	*	*	
		E	71MS25DXEX01XA	S25DEA		X		X		*	*	*	*	*	*	
		F	71MS25DXFX01XA	S25DFA		X		X		*	*	*	*	*	*	
		G	71MS25DXGX01XA	S25DGA		X		X		*	*	*	*	*	*	
		H	71MS25DXHX01XA	S25DHA		X		X		*	*	*	*	*	*	
		I	71MS25DXIX01XA	S25DIA		X		X		*	*	*	*	*	*	
		J	71MS25DXJX01XA	S25DJA		X		X		*	*	*	*	*	*	
		K	71MS25DXKX01XA	S25DKA		X		X		*	*	*	*	*	*	
		L	71MS25DXLX01XA	S25DLA		X		X		*	*	*	*	*	*	
M	71MS25DXMX01XA	S25DMA		X		X		*	*	*	*	*	*			
X - collect and submit																
X - collect and submit ON HOLD																
@ - to be collected after results from the 0-6" sample are received																
@ - to be collected if detected in the 0-6" sample																
* - collect and submitted only if there is an FID response.																

# Final FSP Control Areas

Table A.9-1: MMR Groundwater Samples from Borings				Parameters:	Explosives (Screen 8330)	Explosives (EPA 8330)	Inorganics	Target Analytes:	VOC	SVOC	PCB/Pest.	Herbicide	EDB	MTBE
Area	Loc.	Depth	MMR ID	cont.	250mL	2*1L			3*40mL	2*1L	2*1L	2*1L	3*40mL	3*40mL
				Pres:	none	none			HCl	none	none	none	HCl	thioS
10	MW5	A	71GB05DXAX01XA		X				X					
		B	71GB05DXBX01XA		X				X					
		C	71GB05DXCX01XA		X				X					
		D	71GB05DXDX01XA		X				X					
		E	71GB05DXEX01XA		X				X					
		F	71GB05DXFX01XA		X				X					
		G	71GB05DXGX01XA		X				X					
		H	71GB05DXHX01XA		X				X					
		I	71GB05DXIX01XA		X				X					
		J	71GB05DXJX01XA		X				X					
		K	71GB05DXKX01XA		X				X					
		L	71GB05DXLX01XA		X				X					
		M	71GB05DXMX01XA		X				X					
		N	71GB05DXNX01XA		X				X					
		O	71GB05DXOX01XA		X				X					





# Final FSP Control Areas



A.9-1 Photograph A: Looking northeast from southeast side of MW 4 drill pad.



A.9-1 Photograph B: Looking southwest from southeast side of MW 4 drill pad.



## Final FSP Control Areas



A.9-2 Photograph A: Looking north from southwest side of MW 5 drill pad.



A.9-2 Photograph B: Looking northeast from southwest side of MW 5 drill pad.



# Final FSP Control Areas



A.9-3 Photograph A: Looking south from northeast corner of MW 25 drill pad.



A.9-3 Photograph B: Looking northwest from southeast edge of MW 25 drill pad.

# Final FSP Control Areas



A.9-4 Photograph A: Looking east along the MW 7 Access Road from Turpentine Road.



A.9-4 Photograph B: Looking west along the MW 7 Access Road from MW 7 drill pad.

## ATTACHMENT A: FIELD GUIDE TO HIGH EXPLOSIVES

**Any substance encountered during sampling activities which differs in any way from natural media will be treated as a dangerous substance, carefully removed from the sample, and set aside.**

### EXPLOSIVES

<u>NAME</u>	<u>DESCRIPTION</u>	<u>REMARKS</u>
BLACK POWDER	BROWN TO BLACK	MANUFACTURED IN GRAINS THAT RANGE IN SIZE FROM SMALLER THAN SALT GRAINS TO GRAINS AS LARGE AS SMALL PEBBLES. HIGHLY SENSITIVE TO IGNITION BY HEAT, FRICTION, FLAME, SPARK. WHEN WET, IT IS CORROSIVE TO MOST METALS.
TNT	LIGHT YELLOW TO BROWN OR GRAY	LIGHTLY CORROSIVE WITH LEAD. USED IN BOMBS, GRENADES, DEMOLITION CHARGES, PROJECTILES. EXUDES AT ELEVATED TEMPERATURES. MODERATELY TOXIC BY SKIN ABSORPTION OR INHALATION.
EXPLOSIVE D	BRIGHT YELLOW TO ORANGE. ALSO CALLED AMMONIUM PICRATE.	RELATIVELY INSENSITIVE. HIGHLY TOXIC BY INHALATION, INGESTION, OR SKIN ABSORPTION
AMATOL	LIGHT BROWN TO YELLOW/MIXTURE OF TNT AND EXPLOSIVE D	SLIGHT HYGROSCOPIC. HAS CORROSIVE EFFECTS ON COPPER, BRONZE, LEAD, BRASS. HIGHLY TOXIC BY INHALATION, SKIN CONTACT, INGESTION.
COMPOSITION B	WHITE TO BROWNISH YELLOW, MIXTURE OF TNT AND EXPLOSIVE D	SLIGHTLY CORRODES COPPER, BRASS, CADMIUM, ZINC. USED IN BOMBS, PROJECTILES, GRENADES, SHAPED CHARGES.
OCTOL	LIGHT BROWN	USED IN BOMBS, PROJECTILES, SHAPED CHARGES.
RDX	WHITE. ALSO CALLED CYCLONITE	SENSITIVE TO IMPACT AND FRICTION. SLIGHTLY CORROSIVE WITH COPPER, BRASS, MILD STEEL, CADMIUM. MODERATELY TOXIC BY INHALATION OR INGESTION.
HMX	WHITE. ALSO CALLED OCTOGEN	SENSITIVE TO IMPACT AND FRICTION. SLIGHTLY TOXIC.
PETN	WHITE	SENSITIVE TO IMPACT. SLIGHTLY CORROSIVE TO BRASS, CADMIUM, ZINC. VERY SLIGHTLY TOXIC.



**EXPLOSIVES, continued**

<u>NAME</u>	<u>DESCRIPTION</u>	<u>REMARKS</u>
LEAD AZIDE	WHITE TO LIGHT BROWN	VERY SENSITIVE TO IMPACT, FRICTION, SPARKS. CORROSIVE TO COPPER, ZINC. VERY SLIGHTLY TOXIC.
LEAD STYPHNATE	LIGHT ORANGE TO REDDISH BROWN	SAME AS LEAD AZIDE.
MERCURY FULMINATE	GRAYISH	VERY SENSITIVE TO IMPACT, FRICTION, SPARKS. CORROSIVE TO ALUMINUM, MAGNESIUM, BRONZE, COPPER, ZINC, BRASS. HIGHLY TOXIC THROUGH SKIN ABSORPTION, INHALATION, INGESTION. SYMPTOMS RESEMBLE MERCURY POISONING.

**PYROTECHNIC AGENTS USED AT MMR**

<u>SYMBOL</u>	<u>COMMON NAME</u>	<u>VISUAL IDENTIFICATION</u>	<u>ACTION</u>
CS	NONE	WHITE CRYSTALLINE SOLID	TEAR AGENT
HC	HEXACHORO-ETHANE	WHITE SOLID	SCREENING SMOKE
WP	WHITE PHOSPHOROUS	PALE YELLOW SOLID	SCREEN SMOKE AND INCENDIARY
RP	RED PHOSPHOROUS	REDDISH BROWN POWDER	SCREENING SMOKE

**OTHER COMPOUNDS**

<u>NAME</u>	<u>PROPERTIES</u>	<u>STABILITY</u>
Picric Acid	lemon-yellow crystalline solid	very sensitive to blows or friction
Tetryl	fine yellow crystalline powder	sensitive to blows or friction
Composition A	unknown	unknown
Composition C3	unknown	unknown
Composition C4	unknown	unknown
Pentolite (50/50)	unknown	unknown
Tracer Compound	unknown	unknown
PBX	unknown	unknown
Ednatol	unknown	unknown
Tetrytol	unknown	unknown



## For Reference

Not to be taken from this room

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Bourne, MA 02532

